

REMARKS

This paper is being provided in response to the August 28, 2003 Office Action for the above-referenced application. In this response, Applicant has added Claims 40-56 and amended Claims 1,13, 25, and 34 in order to clarify that which Applicant deems to be the claimed invention. Applicant respectfully submits that the amendments to the claims are all supported by the originally filed application.

The rejection of Claims 1-39 under 35 U.S.C. § 102(e) as being anticipated by EP1039387 (hereinafter referred to as “EP387”) is hereby traversed and reconsideration thereof is respectfully requested. Applicant respectfully submits that Claims 1-39, as amended herein, are patentable over the cited reference.

Applicant’s Claim 1, as amended herein, recites a method of dynamically creating a communication path between first and second storage devices. A connection is created to a source volume on the first storage device and it is indicated that the source volume is not ready to transmit data on the communication path. It is determined which of the source volume and a destination volume contains an initial set of data. After successfully creating the connection to the source volume, a connection to the destination volume on the second storage device is created and it is initially indicated that portions of one of: the destination volume and the source volume do not contain valid copies of data in accordance with which of the destination and the source volumes contains the initial set of data. The destination volume accepts data from the source volume. After successfully creating the connections to the source and destination volumes, it is indicated that the source volume is ready to transmit data on the communication path. Claims 2-12 depend from Claim 1.

Applicant's Claim 13, as amended herein, recites a method of dynamically creating a communication path between first and second storage devices. A connection is created to a destination volume on the first storage device. It is determined which of the destination volume and a source volume contains an initial set of data. After successfully creating the connection to the destination volume, a connection is created to the source volume on the second storage device. It is indicated that the source volume is not ready to transmit data on the communication path and initially it is indicated that portions of one of: the destination volume and the source volume do not contain valid copies of data in accordance with which of the destination and the source volumes contains the initial set of data. The destination volume accepts data from the source volume. After successfully creating the connections to the source and destination volumes, it is indicated that the source volume is ready to transmit data on the communication path. Claims 14-24 depend from Claim 13.

Applicant's Claim 25, as amended herein, recites a computer program product that creates a communication path between first and second storage devices, including: executable code that creates a connection to a source volume on the first storage device and indicates that the source volume is not ready to transmit data on the communication path; executable code that determines which of the source volume and a destination volume contains an initial set of data; executable code that creates a connection to the destination volume on the second storage device and initially indicates that portions of one of: the destination volume and the source volume do not contain valid copies of data after successfully creating the connection to the source volume in accordance with which of the destination and the source volumes contains the initial set of data, wherein the destination volume accepts data from the source volume; and executable code that

indicates that the source volume is ready to transmit data on the communication path after successfully creating the connections to the source and destination volumes. Claims 26-33 depend from Claim 25.

Applicant's Claim 34, as amended herein, recites a computer program product that dynamically creates a communication path between first and second storage devices, including: executable code that creates a connection to a destination volume on the first storage device; executable code that determines which of the destination volume and a source volume contains an initial set of data; executable code that creates a connection to the source volume on the second storage device and indicates that the source volume is not ready to transmit data on the communication path and initially indicates that portions of one of: the destination volume and the source volume do not contain valid copies of data after successfully creating the connection to the destination volume in accordance with which of the destination and the source volumes contains the initial set of data, wherein the destination volume accepts data from the source volume; and executable code that indicates that the source volume is ready to transmit data on the communication path after successfully creating the connections to the source and destination volumes. Claims 35-39 depend from Claim 34.

EP387 relates generally to computing systems and more specifically to techniques for controlling copying of logical volumes within a computer storage system. (Col. 1, Lines 5-8). The create pair command can be used to establish a pair by specifying a primary and a secondary volume. An initial copy operation can be performed from the primary to the secondary volume. The primary volume continues to be accessible to applications during the initial copy. (Col. 5, Lines 5-11). A copy command can be used to create a copy to a secondary volume. Upon

invocation of the copy command, the pair status changes to “paired/copy in progress” and to “paired and copied” when copying is complete. The resynchronize command pair transitions a status to “paired and not copied” after an initial copy is created and compares primary and secondary track maps to determine all unequal tracks between the primary and secondary volumes. Then unequal tracks can be copied from the primary to the secondary volume using the inequality information bits in the control information. (Col. 5, Line 35- Col. 6, Line 6).

Figure 6 illustrates copy processing with a step 602 selecting data tracks for copying having an inequality bit set to 1 indicating that data between corresponding tracks of the primary and secondary volumes is not equal. As data is copied to the secondary volume, the inequality bits are reset. (Figure 6, Col. 7, Lines 17-50).

Applicant's Claim 1, as amended herein, is neither disclosed nor suggested by the reference in that the reference neither discloses nor suggests *a method of dynamically creating a communication path between first and second storage devices, comprising: creating a connection to a source volume on the first storage device and indicating that the source volume is not ready to transmit data on the communication path; determining which of said source volume and a destination volume contains an initial set of data; after successfully creating the connection to the source volume, creating a connection to the destination volume on the second storage device and initially indicating that portions of one of: the destination volume and the source volume do not contain valid copies of data in accordance with which of said destination and said source volumes contains said initial set of data, wherein the destination volume accepts data from the source volume; and after successfully creating the connections to the source and destination volumes, indicating that the source volume is ready to transmit data on the communication path*, as set forth in amended Claim 1. EP387 discloses

a create pair command specifying a primary and secondary volume. EP387 also discloses that embodiments can perform an initial copy operation to copy data from a primary to a secondary volume. However, EP387 appears silent on any arrangement other than the primary volume containing the initial set of data. Accordingly, EP387 neither teaches, discloses, or suggests at least the features of: *a method of dynamically creating a communication path between first and second storage devices, comprising: ... determining which of said source volume and a destination volume contains an initial set of data; after successfully creating the connection to the source volume, creating a connection to the destination volume on the second storage device and initially indicating that portions of one of: the destination volume and the source volume do not contain valid copies of data in accordance with which of said destination and said source volumes contains said initial set of data, wherein the destination volume accepts data from the source volume; ...* as set forth in amended Claim 1.

For reasons similar to those set forth regarding Claim 1, Applicant's amended Claim 13 is also neither disclosed nor suggested by the reference in that the reference neither discloses nor suggests *a method of dynamically creating a communication path between first and second storage devices, comprising: creating a connection to a destination volume on the first storage device; determining which of said destination volume and a source volume contains an initial set of data; after successfully creating the connection to the destination volume, creating a connection to the source volume on the second storage device and indicating that the source volume is not ready to transmit data on the communication path and initially indicating that portions of one of: the destination volume and the source volume do not contain valid copies of data in accordance with which of said destination and said source volumes contains said initial set of data, wherein the destination volume accepts data from the source volume; and*

after successfully creating the connections to the source and destination volumes, indicating that the source volume is ready to transmit data on the communication path, as set forth in Claim 13.

For reasons similar to those set forth regarding Claim 1, Applicant's amended Claim 25 is also neither disclosed nor suggested by the reference in that the reference neither discloses nor suggests *a computer program product that creates a communication path between first and second storage devices, comprising: executable code that creates a connection to a source volume on the first storage device and indicates that the source volume is not ready to transmit data on the communication path; executable code that determines which of said source volume and a destination volume contains an initial set of data; executable code that creates a connection to the destination volume on the second storage device and initially indicates that portions of one of: the destination volume and the source volume do not contain valid copies of data after successfully creating the connection to the source volume in accordance with which of said destination and said source volumes contains said initial set of data, wherein the destination volume accepts data from the source volume; and executable code that indicates that the source volume is ready to transmit data on the communication path after successfully creating the connections to the source and destination volumes*, as set forth in Claim 25.

For reasons similar to those set forth regarding Claim 1, Applicant's amended Claim 34 is also neither disclosed nor suggested by the reference in that the reference neither discloses nor suggests *a computer program product that dynamically creates a communication path between first and second storage devices, comprising: executable code that creates a connection to a destination volume on the first storage device; executable code that determines which of said*

destination volume and a source volume contains an initial set of data; executable code that creates a connection to the source volume on the second storage device and indicates that the source volume is not ready to transmit data on the communication path and initially indicates that portions of one of: the destination volume and the source volume do not contain valid copies of data after successfully creating the connection to the destination volume in accordance with which of said destination and said source volumes contains said initial set of data, wherein the destination volume accepts data from the source volume; and executable code that indicates that the source volume is ready to transmit data on the communication path after successfully creating the connections to the source and destination volumes, as set forth in Claim 34.

In view of the foregoing, Applicant respectfully requests that the rejection be reconsidered and withdrawn.

The rejection of Claims 1-10 and 25-32 under 35 U.S.C. § 102(e) as being anticipated by Gagne, et al. (U.S. Patent No. 6,209,002, hereinafter referred to as “Gagne”) is hereby traversed and reconsideration thereof is respectfully requested. Applicant respectfully submits that Claims 1-10 and 25-32, as amended herein, are patentable over the cited reference.

Claim 1, as amended herein, is summarized above. Claims 2-10 depend from independent Claim 1.

Claim 25, as amended herein, is summarized above. Claims 26-32 depend from independent Claim 25.

Gagne generally relates to redundant data storage devices in a data processing network, and more particularly to a method and apparatus that enables data to cascade through multiple redundant data storage units. (Col. 1, Lines 21-24). Figure 1 discloses a local site 21, first remote site 22, and second remote site 23. Each time the host writes to R1 logical volume (LV) 26, the data is transferred to LV32 of R2 in site 22 so that LV32 acts as a remote mirror of LV26. (Col. 4, Lines 22-29). In a first mode, LV34 of site 22 synchronizes with LV32 of site 22. In a second mode, data transfers from LV34 to an LV 40 of the site 23. (Col. 4, Lines 43-53). Gagne discloses using a DIFFERENTIAL SPLIT cascade command issued from the host to transition from the first to the second mode, and a REESTABLISH command to return to the first mode. In Figure 3, step 96 terminates the mirroring of LV34 as a mirror for LV32 and assigns LV34 of site 22 to copy data to LV40 of site 23. All status bits in the status table 77 in the M2 position for BCV/R1 are set. As data is copied to LV 40, the bits are cleared. To return to first operating mode, a REESTABLISH command can be used. The LV34 is set as a local BCV mirror and obtains the bits in the M3 row of the R2 status table 76 representing any changes made to R2 LV32 while site 22 was operating in DIFFERENTIAL SPLIT mode. Copy program 82 transfers data from LV32 to LV 34 according to the contents of the M3 bit positions of the R2 status register table 76. (Col. 7, Line 43-Col. 9, Line 32).

Applicant's Claim 1, as amended herein, is neither disclosed nor suggested by the reference in that the reference neither discloses nor suggests *a method of dynamically creating a communication path between first and second storage devices, comprising: creating a connection to a source volume on the first storage device and indicating that the source volume is not ready to transmit data on the communication path; determining which of said*

source volume and a destination volume contains an initial set of data; after successfully creating the connection to the source volume, creating a connection to the destination volume on the second storage device and initially indicating that portions of one of: the destination volume and the source volume do not contain valid copies of data in accordance with which of said destination and said source volumes contains said initial set of data, wherein the destination volume accepts data from the source volume; and after successfully creating the connections to the source and destination volumes, indicating that the source volume is ready to transmit data on the communication path, as set forth in amended Claim 1. Gagne discloses each time a host writes to an R1 LV, the data is transferred to another LV in a remote site so that the other LV acts as a remote mirror of the R1 LV. However, Gagne appears silent on disclosing dynamically creating a communication path in which an initial set of data is on anything other than a source device. Accordingly, Gagne neither teaches, discloses, or suggests at least the features of: *a method of dynamically creating a communication path between first and second storage devices, comprising: ... determining which of said source volume and a destination volume contains an initial set of data; after successfully creating the connection to the source volume, creating a connection to the destination volume on the second storage device and initially indicating that portions of one of: the destination volume and the source volume do not contain valid copies of data in accordance with which of said destination and said source volumes contains said initial set of data, wherein the destination volume accepts data from the source volume; ...* as set forth in amended Claim 1.

For reasons similar to those set forth regarding Claim 1, Applicant's amended Claim 25 is also neither disclosed nor suggested by the reference in that the reference neither discloses nor suggests *a computer program product that creates a communication path between first and*

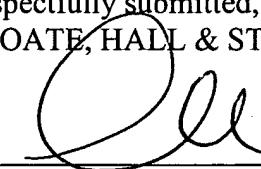
second storage devices, comprising: executable code that creates a connection to a source volume on the first storage device and indicates that the source volume is not ready to transmit data on the communication path; executable code that determines which of said source volume and a destination volume contains an initial set of data; executable code that creates a connection to the destination volume on the second storage device and initially indicates that portions of one of: the destination volume and the source volume do not contain valid copies of data after successfully creating the connection to the source volume in accordance with which of said destination and said source volumes contains said initial set of data, wherein the destination volume accepts data from the source volume; and executable code that indicates that the source volume is ready to transmit data on the communication path after successfully creating the connections to the source and destination volumes, as set forth in Claim 25.

In view of the foregoing, Applicant respectfully requests that the rejection be reconsidered and withdrawn.

Applicant respectfully submits that newly added Claims 40-56 are also patentable over the cited art.

Based on the above, Applicant respectfully requests that the Examiner reconsider and withdraw all outstanding rejections and objections. Favorable consideration and allowance are earnestly solicited. Should there be any questions after reviewing this paper, the Examiner is invited to contact the undersigned at 617-248-4042.

Respectfully submitted,
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